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Wood-inhabiting fungi in southern China 3. A new species of *Phellinus (Hymenochaetales)* from tropical China

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Abstract — *Phellinus minisporus* sp. nov. is described and illustrated from Hainan and Yunnan provinces, southern China. It has resupinate basidiocarps, smaller pores, abundant hymenial setae, and its basidiospores are minute, broadly ellipsoid to subglobose, pale yellowish and fairly thick-walled. The new species is distinguished from the other species in the genus by having minute basidiospores (2–2.5 × 1.6–2 µm).

Key words — *Hymenochaetaceae*, lignicolous and poroid fungi, taxonomy

Introduction

Extensive studies on the *Hymenochaetaceae* in China were carried out recently, and many new species have been described from the country (Dai 1995, 1999; Dai et al. 1997, 2000, 2008a, b; Dai & Xu 1998, Dai & Zhou 2000, Dai & Zang 2002, Dai & Cui 2005, Dai & Yuan 2005, Dai & Niemelä 2006, Wang 2006, Cui & Dai 2008, Dai & Yang 2008, Xiong & Dai 2008). *Phellinus* Quél. is the largest genus in the *Hymenochaetaceae*, and more than 200 taxa are found in the world (Larsen & Cobb-Poulle 1990, Dai 1999, Núñez & Ryvarden 2000, Gibertoni et al. 2004, Ryvarden 2004, Parmasto 2007, Dai et al. 2008b, Dai & Yang 2008). Among them, about fifty species have been recorded from China (Dai 1999, Dai & Niemelä 2006, Dai et al. 2008 b, Dai & Yang 2008).

During the study on wood-inhabiting fungi in southern China, an unknown species of *Phellinus* was identified and described in the present paper.

Materials and methods

The studied specimens were deposited at the herbarium of Institute of Applied Ecology, Chinese Academy of Sciences (IFP), and the herbarium of Beijing Forestry University (BJFC). The microscopic procedure followed Cui et al. (2007). In presenting the variation in the size of the spores, 5% of measurements were excluded from each end of the range, and are given in parentheses. In the text the following abbreviations were used: IKI = Melzer's reagent, IKI– = negative in Melzer's reagent, KOH = 5% potassium hydroxide, CB = Cotton Blue, CB+ = cyanophilous, CB– = acyanophilous, L = mean spore length (arithmetic average of all spores), W = mean spore width (arithmetic average of all spores), Q = variation in the L/W ratios between the specimens studied, n = number of spores measured from given number of specimens. Sections were studied at magnification up to ×1000 using a Nikon Eclipse E80i microscope and phase contrast illumination. Drawings were made with the aid of a drawing tube. Special colour terms followed Petersen (1996) and Anonymous (1969).

Description

Phellinus minisporus B.K. Cui & Y.C. Dai, **sp. nov.** Fig. 1

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Carpophorum perenne, resupinatum. Facies pororum fulva vel hinnulea; pori rotundi vel sinuolati, 8–11 per mm. Systema hypharum dimiticum, hyphae generatoriae septatae, efibulatae. Sporae late ellipsoideae vel subglobosae, crassitunicatae, IKI–, CB(+), 2–2.5 × 1.6–2 μm.

Type. — **China.** Hainan Province, Changjiang County, Bawangling Nature Reserve, on dead angiosperm tree, 3.IX.2006 *Dai 7868* (**holotype** in BJFC, isotype in IFP).

Etymology — *minisporus* (Lat.): referring to the minute basidiospores.

Fruitbody — Basidiocarps perennial, resupinate, firmly attached to the substrate, not readily separable, no odour or taste when fresh, woody hard when dry, up to 12 cm long or more in longest dimension, 4 cm wide, and 4 mm thick at centre; sterile margin narrow to almost lacking, pale yellowish to yellowish brown, less than 1 mm wide. Pore surface yellowish brown to fawn brown, slighting shinning; pores mostly circular, some slightly sinuous, 8–11 per mm; dissepiments thin, entire. Subiculum cinnamon brown to fawn brown, hard corky, ca. 0.1 mm thick. Tubes concolorous with pores, woody hard, up to 4 mm long, tube layers distinct.

Hyphal structure — Hyphal system dimitic; all septa without clamp connections; skeletal hyphae IKI–, CB–; tissue darkening but otherwise unchanged in KOH.

Subiculum — Generative hyphae hyaline to pale yellowish, fairly thick-walled with a wide lumen, rarely branched and frequently simple septate, 2–4.6 μm in

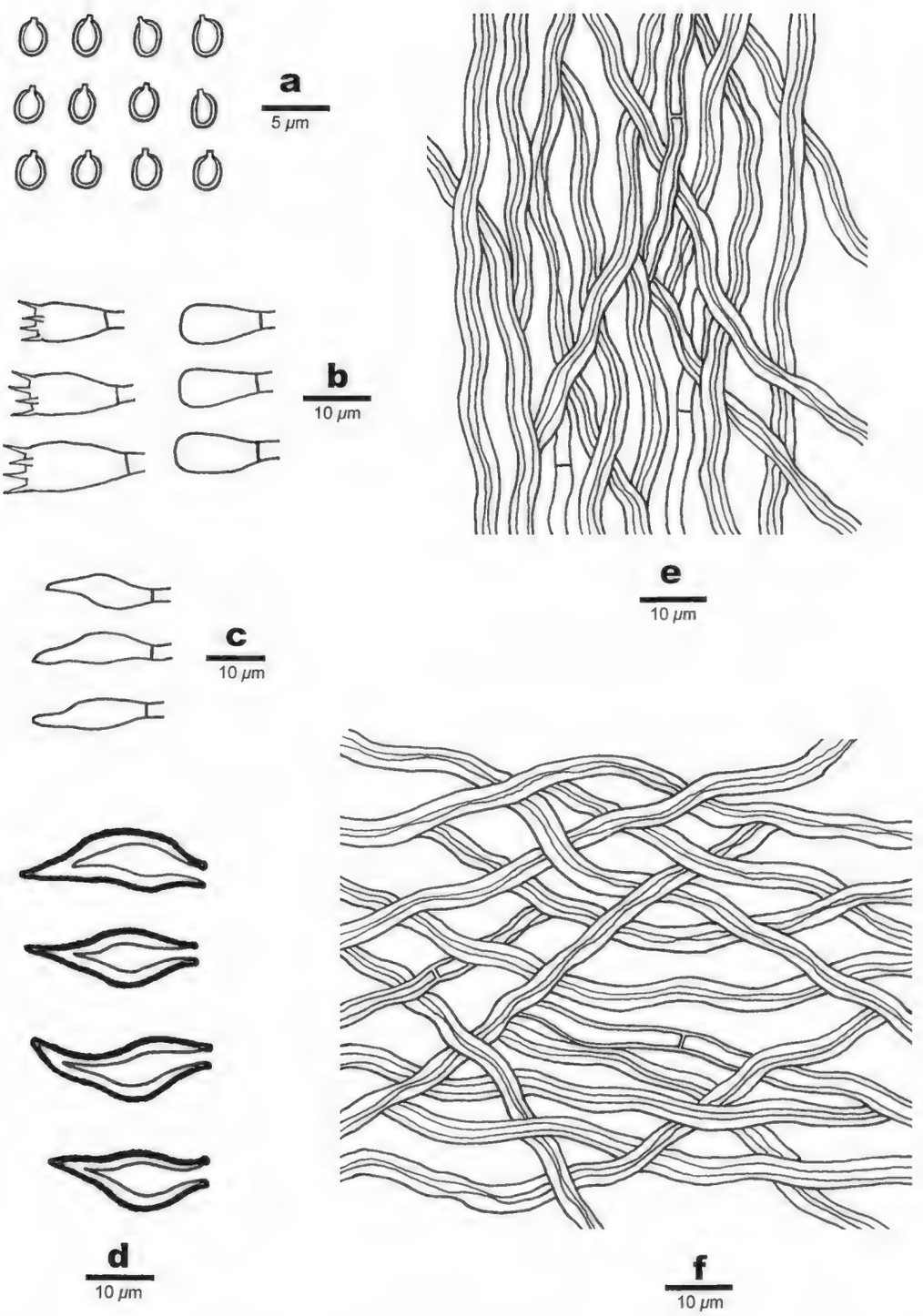

Fig. 1. Microscopic structures of *Phellinus minisporus* (drawn from the holotype). —a: Basidiospores. —b: Basidia and basidioles. —c: Cystidioles. —d: Hymenial setae. —e: Hyphae from tubes. —f: Hyphae from subiculum.

diam; skeletal hyphae yellowish brown to rust brown, thick-walled with a wide to narrow lumen, unbranched, loosely interwoven, 2.5–5.4 μm in diam.

Tubes — Generative hyphae hyaline to pale yellowish, thin- to slightly thick-walled, rarely branched, frequently simple septate, 1.7–3.6 μm in diam; skeletal hyphae yellowish brown to rust brown, thick-walled with a wide to narrow lumen, more or less straight, regularly arranged, agglutinated, 2.2–5 μm in diam. Hymenial setae frequent, ventricose to subulate, dark brown, thick-walled, 16–30 × 5.4–9.5 μm. Cystidia absent, fusoid cystidioles occasionally present, 9.2–16.7 × 3.5–5.6 μm; basidia barrel-shaped, with four sterigmata and a simple septum at the base, 9–15 × 4.6–7.5 μm; basidioles in shape similar to basidia, but slightly smaller. Rhomboid crystals frequently present in trama and hymenia.

Spores — Basidiospores broadly ellipsoid to subglobose, pale yellowish, fairly thick-walled, smooth, IKI–, weakly to moderately CB+, (1.8–)2–2.5(–2.8) × (1.5–)1.6–2(–2.3) μm, L=2.21 μm, W=1.92 μm, Q=1.12–1.2 (n=120/4).

Additional specimens (paratypes) examined. — **China.** Yunnan Province, Mengla County, Xishuangbanna Nature Reserve, on fallen angiosperm branch, 16.IX.2007 *Yuan 3586* & *3589* (BJFC & IFP). Guangxi Autonomous Region, Longzhou County, Nonggang Nature Reserve, on fallen angiosperm trunk, 4.VII.2007 *Zhou 170* (BJFC & IFP).

Type of rot — White rot.

Remarks — *Phellinus minisporus* has resupinate basidiocarps, smaller pores, abundant hymenial setae, and minute, broadly ellipsoid to subglobose, pale yellowish and fairly thick-walled basidiospores. These characters distinguished it from other species in the genus.

Four species in *Phellinus, P. cesatii* (Bres.) Ryvarden 1972, *P. ferrugineo-velutinus* (Henn.) Ryvarden 1972, *P. glaucescens* (Petch) Ryvarden 1972, and *P. purpureogilvus* (Petch) Ryvarden 1972, have resupinate basidiocarps, ventricose setae and small, colored basidiospores (Larsen & Cobb-Poulle 1990, Dai 1999), however, the basidiospores of the above species are more or less bigger than those of *Phellinus minisporus*: 3.3–4.1 × 2.5–3.1 μm in *P. cesatii* (Dai 1999), 2.5–3.3 × 2–2.5 μm in *P. ferrugineovelutinus* (Dai 1999), 3.5–4 × 3–3.5 μm in *P. glaucescens* (Larsen & Cobb-Poulle 1990), 3.5–4.5 × 3–4 μm in *P. purpureogilvus* (Larsen & Cobb-Poulle 1990).

Phellinus rufitinctus (Berk. & M.A. Curtis ex Cooke) Pat. 1900 may be confused with *P. minisporus* by having similar smaller basidiospores, however, it has tramal setal hyphae, and its basidiospores are hyaline and thin-walled (Gilbertson & Ryvarden 1987, Larsen & Cobb-Poulle 1990, Ryvarden 2004).

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Literature cited

Anonymous. 1969. Flora of British fungi. Colour identification chart. Her Majesty's Stationery Office, London.

Cui BK, Dai YC. 2008 Wood-rotting fungi in eastern China 2. A new species of *Fomitiporia* (*Basidiomycota*) from Wanmulin Nature Reserve, Fujian Province. Mycotaxon 105: 343–348.

Cui BK, Dai YC, Decock C. 2007. A new species of *Perenniporia* (*Basidiomycota, Aphyllophorales*) from eastern China. Mycotaxon 99: 175–180.

Dai YC. 1995. Changbai wood-rotting fungi 3. The genus *Phellinidium* (*Basidiomycetes*) and a new species, *P. aciferum*. Ann. Bot. Fennici 32: 63–73.

Dai YC. 1999 *Phellinus* sensu lato (*Aphyllophorales, Hymenochaetaceae*) in East Asia. Acta Bot. Fennici 166: 1–115.

Dai YC, Cui BK. 2005. Two new species of *Hymenochaetaceae* from eastern China. Mycotaxon 94: 341–347.

Dai YC, Cui BK, Decock C. 2008a. A new species of *Fomitiporia* (*Hymenochaetaceae, Basidiomycota*) from China based on morphological and molecular characters. Mycological Research 112: 375–380.

Dai YC, Cui BK, Tao WQ. 2008b. *Phellinus mori* sp. nov. (*Basidiomycota, Hymenochaetales*) from northern China. Mycotaxon 105: 53–58.

Dai YC, Niemelä T. 2006. *Hymenochaetaceae* in China: hydnoid, stereoid and annual poroid genera, plus additions to *Phellinus*. Acta Botanica Fennica 179: 1–78.

Dai YC, Niemelä T, Zang M. 1997. Synopsis of the genus *Inonotus* (*Basidiomycetes*) sensu lato in China. Mycotaxon 65: 273–283.

Dai YC, Xu MQ. 1998. Studies on the medicinal polypore, *Phellinus baumii*, and its kin, *P. linteus*. Mycotaxon 67: 191–200.

Dai YC, Yang F. 2008. A new species of *Phellinus* (*Basidiomycota, Hymenochaetales*) from western China. Mycotaxon 104: 103–106.

Dai YC, Yuan HS. 2005. *Inocutis subdryophila* (*Basidiomycota*), a new polypore from China. Mycotaxon 93: 167–171.

Dai YC, Zang M. 2002. *Fomitiporia tibetica*, a new species of *Hymenochaetaceae*. Mycotaxon 83: 217–222.

Dai YC, Zhang XQ, Zhou TX. 2000. Changbai wood-rotting fungi 12. Species of *Hymenochaete* (*Basidiomycota*). Mycotaxon 76: 445–450.

Dai YC, Zhou TX. 2000. A new species of *Inonotus* (*Basidiomycotina*) from Yunnan, southern China. Mycotaxon 74: 331–335.

Gibertoni TB, Ryvarden L, Cavalcanti MAQ. 2004. Studies in neotropical polypores 18. New species from Brazil. Synopsis Fungorum 18: 44–56.

Gilbertson RL, Ryvarden L. 1987. North American polypores 2. *Megasporoporia - Wrightoporia*. Fungiflora, Oslo. pp. 434–885.

Larsen MJ, Cobb-Poulle LA. 1990. *Phellinus* (*Hymenochaetaceae*). A survey of the world taxa. Synopsis Fungorum 3: 1–206.

Núñez M, Ryvarden L. 2000. East Asian polypores 1. *Ganodermataceae* and *Hymenochaetaceae*. Synopsis Fungorum 13: 1–168.

Parmasto E. 2007. *Phellinus laevigatus* s.l. (*Hymenochaetales*): a ring species. Folia Cryptog. Estonica 43: 39–49.

Petersen JH. 1996. Farvekort. The Danish Mycological Society´s colour-chart. Foreningen til Svampekundskabens Fremme, Greve.

Ryvarden L. 2004. Neotropical polypores part 1. Introduction, *Ganodermataceae* and *Hymenochaetaceae*. Synopsis Fungorum 19: 1–229.

Wang HC. 2006. A new species of *Inonotus* (*Basidiomycetes*) from China. Nova Hedwigia 83: 137–142.

Xiong HX, Dai YC. 2008. A new species of *Inonotus* (*Basidiomycota, Hymenochaetaceae*) from China. Cryptogamie Mycologie 29: 279–283.